

## MEMORANDUM FOR RECORD

SUBJECT: ORMSS General Lock Model Meeting of 9 -10 Nov 99

1. The Ad-Hoc Group, formed under the auspices of the Regional Navigation Design Team, met in Vicksburg, MS at the Waterways Experiment Station (WES) to continue discussions on the Lock Model Facility for Filling and Emptying Systems as it relates to the Ohio River Mainstem System Study (ORMSS). Those in attendance are listed below:

<u>NAME</u>	<u>ORGANIZATION</u>	<u>TELEPHONE/FAX NO.</u>
John Hite	CEERD-HN-N	601-634-2402
Jose E. Sanchez	CEERD-HN-N	601-634-3895
David Schaaf	CELRL-ED-DS	502-582-6967/5108
Byron McClellan	CELRL-ED-D	502-582-5691
Brian Houston	CELRL-ED-DS	502-582-6009
Coy Miller	CELRH-EC-WH	304-529-5601/5960
Jason Merritt	CELRH-EC-DS	304-529-5741/5209
Billy Arthur	CELMS-ED-HE	314-331-8333
Tom Quigley	CELMS-ED-DA	314-331-8220
Michael Fallon	CELRH-EC-D	304-529-5202/5209

2. The meeting began at 1300 hrs with introductions from attendees. The agenda generally covered the following topics/points: Update from WES on Model Status; Discussion and Finalizing of Details for WES; Construction and Testing Schedule; Funding Status; Site Visit to Model or to fabrication shop (time permitting).

3. The milestones identified in the schedule provided by WES in Oct 99 are still on track for completion. Facility design and construction are well underway and due for completion in mid-December. Design and construction for the actual Lock Model was just getting underway at the beginning of Nov 99 and is scheduled for completion by the end of Mar 99. Phase I testing is scheduled to begin on/about 1 Apr 99.

4. Discussion then focused on the many details to be resolved e.g. various culvert sizes to be considered for modeling, minimum draft vs. minimum pool, whether or not emergency sills should be included in model design, and culvert transitions into and out of lock walls. It was generally agreed that the most severe of physical constraints should govern. If the test results were favorable at Greenup Locks then similar parameters applied to J.T. Myers Locks should also provide favorable results. Messrs. Schaaf and Houston provided a handout/discussion on the ORMSS Physical F/E Model - Testing Computations Culvert Design (**Enclosure 1**). The computations provided a scenario for the new supplemental culvert size along with the proposed location. The computation package also included proposed configurations for the filling and emptying culvert systems.

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5. Mr. Schaaf then provided a handout for discussion regarding the costs associated with the triple culvert through the sill system (General Model) vs. the wrap around culvert option (**Enclosure 2**). The cost estimate that was developed was for a through-the-sill supplemental culvert system specific to the quantities at Markland, which is very similar to Greenup. However, the culvert design was determined using properties at Greenup. Costs were considerably higher for the wrap around system (approximately three times). Reviewing the cost estimates at both sites (Myers and Greenup) easily shows that going with the through-the-sill option generates savings. The largest savings are generated by less extensive site preparation, no excavation/shoring required, no drilled shaft wing wall, relocation of fleet mooring facility not required, etc.

6. Messrs. Schaaf and Houston then presented plan sheets of the proposed General Lock Model, which will serve as the guide plans for WES's construction effort (**Enclosure 3**). Detailed discussions followed regarding the configuration of the culverts as they transition back into the walls, the location of the new auxiliary lateral field, and the pintle to pintle distance. It was also determined that the title of these drawings should read, "ORMSS General Lock Model - Filling and Emptying System".

7. The final actions/decisions were reviewed and noted before closing the meeting:

a. LRH will conduct numerical modeling in order to perform a sensitivity analysis of the F/E system by varying the culvert size (cross-section) for Myers and Greenup. This action has been completed and the results of this numerical analysis can be found in the CELRH-EC-WH memorandum, dated 26 Nov 99, subject: Ohio River Mainstem Study Numerical Model Investigations (**Enclosure 4**). This investigation revealed that the potential exists for reductions in fill times due to implementing supplemental F/E features.

b. WES will conduct innovative research with flume tests to analyze the effects of locating the laterals over the existing ports in the 600' lock and place a block at the 800' point to simulate the extension. Initial thoughts are to place new culvert 12.5' away from chamber walls (Greenup will be the control design in this case).

c. WES will conduct navigational tests with respect to draft when the new flume is operational.

d. WES will site adapt data from results determined in 7.a. and 7.b. for the model construction. The number of laterals, positions, sizes, w/without emergency sill, pintle to pintle distance, and minimum submergence are all physical characteristics to be optimized by the WES modeling effort. For consistency, top of upper miter gate will be designated at 100'm.s.l. and the station of the upper pintle centerline will be 0+00.

e. There will be no butterfly valves, reverse tainter valves in walls. Distance of valves to the new lateral field is critical.

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- f. LRL and LRH to provide WES with working sketches of possible culvert transitions.
  - g. LRH to provide LRL with half-size drawings of Meldahl and Greenup Locks.
  - h. All attendees agreed that the Lock Model Scope of Work, dated 7 Sep 99, should be revised to reflect the discussions and decisions rendered during this meeting. The current version, dated 2 Dec 99, has been reviewed and approved by all Ad Hoc Group members (**Enclosure 5**). It will be forwarded to WES for their guidance and continuing efforts on the ORMSS Lock Model Testing Program.
8. CELRL has provided WES with all the funds necessary to complete the design and construction of the facility that will house the model. Additional funding has since been forwarded to WES for the design and construction of the lock model. Funding for the Phase 1(a) effort will be forwarded as WES approaches the start of that specific item.
9. The meeting concluded with a visit to the model fabrication shop.

Enclosures

As stated w/o Encl 3

MICHAEL P. FALLON, P.E.

Ad-Hoc Group Chair

CELRD Regional Navigation Design Team

Copies Furnished via web site:

Each Attendee

CELRD-ED/Joe Keith, RNDT Chairman